

Jas. Hurst

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HOW TO ENSURE CORRECT EXPOSURE

BY

A. HORSLEY HINTON

EDITOR OF "THE AMATEUR PHOTOGRAPHER"

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INTRODUCTION

THE Little Books on photography of which this is one are the outcome of "The Practical Lessons for Beginners" which have appeared every week since July, 1904, in *The Amateur Photographer*, and are still continuing. The unparalleled expression of appreciation with which those "Lessons" have met leaves little room for doubt that there are very many who would find such plain talks on every-day photographic practice useful in book form. To merely reprint the "Lessons" from *The Amateur Photographer* would hardly have been sufficient, and the subjects dealt with, therefore, have been entirely re-written. This book should be read in connection with the Little Book entitled "Development Made Easy—the Sure and Easy Development of Plates and Films"; whilst another, "How to Make Bad Negatives into Good," is at once the complement and supplement of both.

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HOW TO ENSURE

CORRECT EXPOSURE



I do not see how the beginner in photography can expect to get good negatives with anything like regularity, if he does not know a good negative when he sees it; and yet, as a matter of fact, that is what plenty of people are trying to do.

It really isn't difficult to make good negatives, once you take the trouble to understand what it is you are going to try for; but it consists of two distinct things, each dependent on the other. These are exposure and development, and I imagine my reader saying, "Just so! It is always in one or the other that I go wrong, and do not always know in which. Sometimes I get really nice negatives, and then I seem to have a run of ill-fortune, and don't get a good negative for a long time; I can never be certain." But when you do get a good negative, is it not a fact that you are so pleased and satisfied that you do not stay to ascertain *why* it has turned out good, so as to be able to repeat the conditions and so repeat the success?

The fact that you do sometimes, no

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matter how rarely, get a success without doing anything special to secure it, ought to conclusively show you that there is nothing very difficult about it; and yet you are content to go muddling along, satisfied if you get a good negative now and again, and promptly forgetting the huge number of failures and the disappointment of finding often enough just the very subjects you most counted on turn out badly, and you don't know why.

Now, I am not going to trouble you about the theory and principles of development or anything of that sort, because there are scores of text-books which will explain all that when you want it. I am going to try and give you a method by means of which you can be pretty well certain every time of getting a good negative.

That'll be useful, will it not? If you have some particular subject which you will not be able to do again—something of which you have promised a friend copies, and do not want to fail because it will be so humiliating—it would be worth while taking just a little more trouble, if only that will make you sure of a good result; and after a time, when by adopting a particular course you have grown accustomed to make good negatives, then quite gradually you may be able to dispense with all precautions, and good negative-making will become instinctive.

Now, then, just consider what hap-

pens when, with plate or film in the camera, you uncover the lens, either by releasing a shutter or by removing the cap? The light pours into the otherwise quite dark camera. We see things because every object, every part of every object, sends—that is, reflects—a ray of light to our eye, and according as that ray is swift and powerful or slow and weak, so we see things as light or as dark.

The same thing happens in the camera. You have got to think of these rays of reflected light pressing on the lens cap, striving for admission, until the lens is uncovered, and then in they go, instantly impressing themselves on the sensitive film—some feebly, some strongly; and then you close the lens again, and whatever amount of light impressions the film has received development will subsequently reveal. If the lens has been left open too long the film will prove to have been impressed too much; if, on the other hand, the lens was covered again too soon—that is, before the feeble rays have had just enough effect, whilst the strong ones, of course, have not overdone it—then it will become evident that development cannot bring out what is not there to be brought out.

Right exposure, then, is that happy medium which gives time for the weak light to have enough effect, whilst the strong has not had too much.

Of course, if you have a subject in the full blaze of sunlight, even though it

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comprise some quite dark objects, such as parts of buildings, trunks of trees, etc., the light that scene reflects is very many times more intense and forceful than a similar subject on a dull day, or a scene under the shade of trees ; and unfortunately, our eyes are not able to gauge the difference—they so soon adapt themselves, that after a second or two we are able to see in the deep shade of the forest as well as when out in the open, and when we uncover the lens we are unable to see what is going on inside the camera.

Presently I am going to try to give you a perfectly simple way of telling what the light is capable of doing, and, in that way, of judging whether to give a long or a short exposure. But first of all I want you to quite understand what is a rightly exposed negative.

Here, in figs. 1, 2, and 3, we have reproductions of three negatives sent to me by a beginner in photography for my advice. These three belong to the same batch of exposures made one Saturday afternoon recently, and the producer has no idea why a print from one is so black (fig. 1A), that from another is so foggy (fig. 3A), whilst another (fig. 2A) is so much clearer and more satisfactory looking. He says he is under the impression that he gave the same exposure in each case. Why, then, are the results so different ?

It is not possible to efficiently represent a glass negative by an ink print, though I have tried, so the

reader must make allowances, and from figs. 1, 2, 3, try and imagine what these little negatives were like, and compare them with the reproductions of the prints reproduced as figs. 1A, 2A, and 3A.

The negative marked fig. 2 is correct as regards exposure and development, as will be seen by the reproduction of its print. Notice that there is sufficient contrast between the lights and the shadows. The latter are not like soot, nor are the former plain white paper. The sky is just a little lower in tone than white, and may thus be taken to fairly correctly represent the clear sky of a cloudless summer day.

Now turn to fig. 1. Were the glass of the original of this in your hand, and you held it up and looked through it towards the light, you would find that you could see quite through the greater part of it as though it were a piece of rather dirty window glass. Lay it down, and you can with more or less distinctness read the printed page beneath it. Only in one or two small spots is the negative dense, and then it is nearly opaque. Print from this, and what do you find? Naturally, that where the glass is nearly clear the printing paper discolours to the darkest possible tint in a very short time, whilst the very dense spot quite resists the passage of the light, a spot of white paper being the consequence. You may be able to faintly make out that the black masses in the print are

intended for trees, the white spots being the sky seen through the twigs and branches; but what a travesty of trees! Think what a misrepresentation of all the infinite gradations of tint or tone in the masses of foliage. In fig. 2 the tree stem and hill slope at least appear solid and round, as though of substance and not cut out of paper. Why, then, is this not the case with fig. 1?

The producer of these three negatives tells us he gave the same exposure in each case. Well, then, think for a moment what happened in each instance. The landscape, standing in the open, receives the full flood of daylight as it descends from the sun or the sky,—light so bright that it makes an awakening sleeper blink, it tans the cheeks, it fades bright colours, and in a thousand ways gives evidence of its intensity and power. Now the image, whatsoever the subject, which reaches the lens, or the eye for that matter, is this light reflected from the surface of the various objects. With lightning speed it penetrates into the camera and affects the sensitive plate waiting to receive it in, probably, the fraction of a second; and if we have judged that fraction correctly, giving just sufficient time for the power of the light at the time to impress the plate to the proper degree, we shall on subsequent development obtain a good negative, which will afterwards yield a print in which the lights and darks are in about the

same relation as the lights and darks in the original scene.

Suppose from this scene we turn down a shady lane or under trees at the edge of a common or coppice, and are grateful for the cool shade. Now if we expose another plate for the same length of time as before, think how very much less volume of light will have time to reach the plate. The little peep of distance between the trees is a peep of landscape out in the full sunshine, just like the one we have just seen, and accordingly it has affected the plate to about the same degree, but the trees were all more or less in shade. Some of the details in the trunks, a few of the lightest branches, and a tuft of leaves here and there have just been able to make their impression on the plate; but all below them in brightness have failed to do anything at all, and hence, when the plate was developed to bring out any hidden image there might be there, after the few details mentioned had responded to the developer, there was nothing more to come out. And then, in leaving the plate a little longer in the hope of getting something more, the light peep between the trees gained too much density, and so appears too white. The excessive blackness, then, is not because the plate has represented the trees as black, but because all but some lighter details are not represented at all. The plate was not exposed long enough to receive, accumulate and retain the

feeble light reflected to it by the dark and shady foliage.

What ought to have been done is this:—The photographer should have said to himself, How much less light is reflected by the shady trees than is reflected by the brightly illuminated landscape beyond? It was probably ten times less. In which case the lens should have been allowed to remain uncovered for ten times as long, so as to allow the same amount of light to enter.

If water is running from a tap into a barrel ten times less fast than from another tap which fills a barrel of the same size in five minutes, it will require fifty minutes to achieve a similar result. So that if the exposure for the open landscape was, let us say, one-tenth of a second, the trees in shadow should have received one second. Now probably the too-white peep of distance is surrounded by a slight white haze, as though the light had spread over the immediately encircling foliage. This spreading of the light is called “halation,” and usually occurs when a very light object comes next to a very dark one, as in the present case. It *can* be, and therefore certainly should be, entirely prevented, but as I shall have more to say of this later on, we will just now let it pass.

Now, perhaps, the photographer in question will say that had he given the trees one second's exposure he would not have got a sharp image,

because he would not have been able to hold the camera quite still during that period. It is, you see, a case of a hand camera being used in a case for which a hand camera *used as such* is not the most suitable instrument. If a small stand of some sort had been carried, the camera could have been supported and an exposure of one second or longer given with safety.

Note this, then—that a hand camera is not complete without a tripod for use when required. A “*hand*” camera is so called because it *can*, when circumstances favour, be used whilst held in the hand, but it must not be supposed that it is only to be used in that way.

However, in the present case, the difficulty could possibly have been overcome in the following way.

Your lens is probably provided with what are called “stops,” or a revolving affair inside which alters the size of the lens aperture, and is marked at intervals 8, 11, 16, 22, 32, etc.

Never mind for the present what these figures signify. All I want just now is to show how the stops usually associated with focussing can be called into use for helping in giving correct exposure.

Suppose the view I am imagining was made with the lens “stopped” at “22.” Notice that each stop with a *lower* number has a *larger* opening, and the larger the opening, of course, the more light can enter. As a matter of fact,

each next larger opening admits twice the amount of light that its smaller one does. So that if "22" was used for one-tenth of a second, had "16" been used it would have been equal to giving one-fifth or double of one-tenth, and "11" would have been like giving two-fifths, which is getting on towards half a second, and "8" would equal one second or nearly. So you see that, had the stop been altered from "22" to "8," the one-tenth of a second exposure would have admitted as much light as though ten times the exposure had been given. The darker the subject, the larger the opening of the lens. Is that clear?

But now, suppose that this had been done, and then with the "8" stop we had wandered out from the shady trees into a full glare of sunshine, and, forgetting to change the stop, we gave a similar exposure to a sunlit scene. Why, it would be like giving an exposure of one second where one-tenth would have been correct, and the result would be over-exposure; the light parts, such as the sky, would be so much overdone that there would be scarcely any difference between the sky and the trees.

But why should there be this want of difference? I will try and explain, because this is a matter you must know a little about, though I shall not expect you to acquire a very complete scientific knowledge.

When I speak of light affecting or impressing the plate, it is of course

understood that it does so invisibly, and we only know what has happened after development. So look at fig. 3; it is very much "all over alike," and when you glance at the print made from it, fig. 3A, you see that whilst the trees are about dark enough, the sky is so dark that you can scarce see the difference.

As the picture is formed by light impressing the plate, you might quite naturally suppose that, as there is more light from the sky than from the trees, the greater volume of light would have simply gone on impressing the plate, making it darker and darker, whilst the trees, etc., were gradually getting their feeble reflections duly recorded. But you have to bear in mind that the effect of light on the sensitive plate is not quite what one might expect, because after it has had its full effect—when it has impressed the film as much as that film is capable of being impressed—the action becomes reversed and gradually undoes what it had previously done; that is to say, each ray of light is like a continuous fusilade of bullets—tap, tap, tap—impressing the film more and more until the film can receive no further impression; then each tap begins to undo the previous effect, so that by the time the rays of light from the sky have effected their maximum impression, the trees will only have got along about half way—and so, if exposure is continued to allow

the trees to finish, the sky has exceeded the maximum, and is momentarily undoing, on the film, the desired effect, and is, so to speak, half way back to the original state. And so it comes about that the sky, instead of being underdone as compared with the rest of the scene, is, as a matter of fact, overdone to the extent of about one and half times.

Do you know that if you photograph an ordinary landscape and *include the sun*, then it often happens that the sun will, when the negative is printed, appear as *black* instead of light? And this is because, if sufficient exposure has been given to secure the landscape properly, the sun, being so much lighter and therefore properly requiring so much less exposure, has had time to get so over-photographed that it has become completely reversed.

When, then, you have a print which is gloomy and dull, the view appearing as though emerging from a fog, instead of supposing, as a novice might very well do, that it wants more done to it to bring it out clearer, you may know that it is overdone—that is, over-exposed, like food that has been over-cooked until reduced to a homogeneous mess.

You should, then, get accustomed to distinguish between negatives which have been over-exposed and those which are under-exposed, and decide by comparison with the illustrations

given in these pages what constitutes a really good negative.

All this you may be finding rather tedious and uninteresting, so we will now get to work, my object being to help those who, even after practising photography for a considerable time, still find negative-making a mystery; the two principal points of difficulty being "How long to expose?" and "When to stop development?"

At the outset I want my reader to thoroughly grasp the fact that exposure and development are so intimately connected with each other that the latter can do little if the former is not approximately correct. Perhaps you have not heretofore quite understood that point. Perhaps you are not even now struck with the full importance of it. You say, "Yes, I understand; I must get my exposures right before I can expect to develop them well." Nevertheless, you will take no particular steps to find out if your exposures have hitherto been within the mark; or do you wait until next occasion, and simply say to yourself, "I will give a different exposure to what I usually do, and see if I can get better results"? But whether you ought to give more or less than it has been your custom to give you hardly know.

Generally I find individuals are instinctively inclined one way or the other. I find, for instance, one beginner who evidently has a totally

false impression of the power of light, and not having realised within how short a time the plate is impressed, invariably over-exposes. On looking through the negatives of another, I find repeated evidence of his not having considered how relatively dark the particular subjects depicted really are, and consequently his plates show a proneness to under-exposure; and it may help you if you will look through your own negatives and see if the majority of them incline to the appearance of fig. 3, which has been over-exposed, or to fig. 1, which has been under-exposed. If this examination indicates that you have a natural tendency to over-expose, you will at least know what to guard against; but the plan I want you to adopt will leave nothing to chance or guesswork, and whilst I do not propose to bother you with anything like a tedious course, I do want you to just for once be serious and systematic, only for an hour or so; and I think I may promise that in that time, with the expenditure of, say, half a dozen plates, you shall be in possession of a method which will ensure you for ever after getting good negatives. And when you consider how many dozens of plates you have used and spoilt, I think you will admit that it is worth while having a try.

Now I want you to buy an exposure meter, costing about 2s. 6d. and upwards; but do not run away with the

idea that you have got to learn how to use it, because I know that with a good many even its simple series of figures are perplexing. Indeed, I only want you to become possessed of the sensitive paper contained therein for the purpose of testing the power of the light. Ordinary P.O.P. will do, but unless the weather be very clear and bright it takes rather longer to discolour than is convenient.

And now be good enough to make up your mind as to what kind of plates or films you are going to use. No, don't ask me to recommend any, because I should say, "*Any* well-known brand"; there is, except for more advanced work, nothing to choose between half a dozen or a dozen of the best-known brands. I should not advise using quite the slowest nor the most extra rapid grades, but a plate of a "medium" or "rapid" variety. But I want you to keep to one particular make and speed exclusively for the next month or two, until you have gained a certain amount of confidence. Keep, then, to one brand of plates. We have already had something to say about "stops" or lens diaphragms, and you now know that the size of the stop or aperture has a direct influence on the length of exposure to be given. I want you, then, to *keep to one particular stop*, and probably F/16 will be the best. Put F/16 stop into the lens, and make up your mind that you will not alter this until you have

learnt how to expose with accuracy. So, then, we have one plate and one stop, and if we now ascertain the power of the light, and hit on the right exposure once, we shall be able to get the right exposure ever after, as soon as we know the power of the light on each occasion.

You do not, perhaps, quite see this. Well, it will be obvious that, if the speed or sensitiveness of the plate is altered, the requisite exposure must be changed again. If we use a larger or smaller stop—or aperture—it follows that, as a greater or a less amount of light is thereby admitted, the exposure will have to be less or more, shorter or longer, if the same volume of light is to be admitted. Therefore, I propose we do away with the changeability of these two factors by settling on one plate and one stop. The other factor which determines the length of the exposure is, of course, the character of the light at the particular moment, and what that is we shall presently ascertain.

If on some particular day we made a very nicely exposed negative by giving it *one second*, and we ascertained subsequently that on that occasion the light was of a power which we will for example call “10,” then if on another day we found out that the light had a power represented by “15,” we should know that an exposure of *one-and-a-half seconds*, or one-tenth of “15,” would give the same excellent result that

one second yielded when the light was "10"; and it is precisely that proportion, that relation between the lens exposure and the light power, which we can ascertain for ourselves in a very short time; and having done so, we shall have a key to exposures in nearly all conditions and circumstances ever after.

Proceed, then, to fill the three double dark slides with the particular brand of plates already determined on; set up the camera anywhere out-of-doors in a fairly open position; place F/16 stop in the lens; and having capped this, take the exposure meter in the hand, and notice that it has a little tinted spot which is to be the standard colour—and beside this is the sensitive paper, which rapidly discolours with the light.

Take the exposure meter into a situation where it would receive about the same kind and same degree of light which the darkest or chief objects in the view will receive.

The instant you uncover the sensitive paper the daylight begins to act on it, and you must, therefore, instantly begin counting seconds until the paper has become discoloured as dark as the standard tint.

Suppose this occupies twelve seconds—and, mind you, you must count real seconds, sixtieths of a minute, not just one, two, three, spoken at random. Now you want to find, by actual experiment, what *proportion* of the time

taken to tint the paper will the negative require to be exposed. So, in order to, as it were, feel the way, expose your first plate for one second, your second plate for three seconds, and a third for six seconds—that is, one-twelfth, one-fourth, and one-half of the time it took to tint the paper. That is all the experiment, and the result will show us what to do for ever in future. We take these three plates, and using the developer we usually employ, or which we have decided we always will employ, proceed to develop these to the best of our ability, making careful note of which is which ; or, if we hesitate to do this, we can number each plate and get some professional to develop them for us, telling him to treat them all in precisely the same way. When they are developed we decide which is the correctly exposed one ; and it is just here, perhaps, that my reader says, “It’s all very well, but how am I to decide ? They all look different ; I don’t know which is correct.”

I think comparison of your three results with fig. 2 ought to enable you to determine, but I know that what may seem quite simple to any one accustomed to look at negatives, is not so easy to the uninitiated, and so an easier course will be to print from the three negatives, and see which print most nearly resembles in character the better class of photographic views one may purchase in shops.

Since writing the foregoing, and, in-

deed, whilst the pages of this Little Book have been in preparation, I have announced in *The Amateur Photographer* that, in order that the novice should have an actual standard negative with which to compare his own productions, I will send on loan to any one sending two penny stamps to the *Amateur Photographer* Office, 52, Long Acre, London, one of my own film negatives, and this may be borrowed for a fortnight, during which time prints may be made, and, if desired, sent to me for criticism. The response to the offer was such that it at once necessitated my putting into circulation more than one hundred negatives, but by the time this Little Book is published many of these negatives will have been returned to me, and so will be available for others to borrow. Any one may thus clear up any doubt as to what constitutes a *good* negative.

Whatever course you adopt, you have got to find out which of the three exposed and now developed plates is the best. Suppose you decide that plate number 2 is the correct one, which was exposed for three seconds, or *one-fourth* of the time it took to tint the paper in the meter. Then if on another occasion the paper takes twenty seconds to tint, the right exposure will be five, or *one-fourth*. It must always be one-fourth the light test, so long as stop and plate are the same. Of course, I do not mean to say because the second plate exposed

on any given occasion was correct and was exposed for three seconds, that therefore, with same plates and F/16, three seconds will always be right. Three seconds proved to be right because three seconds were one-fourth of the time it took to colour the paper to the standard tint. At some other time the paper might take twenty seconds, and then five seconds would be right exposure, five seconds being one-fourth of twenty.

For instance, you might be photographing on an open common, and your picture intended to include distance—clouds, etc. You test the light, holding the meter in full sunshine, because your subject is in full sunshine, and maybe the paper is tinted to the standard hue in two seconds, in which case the exposure for your sunlit landscape being *one-fourth*, it would be just half a second. In the shade of large trees the test would, perhaps, give two minutes, or 120 seconds; then the exposure would be thirty seconds, still *one-fourth*.

I hope the necessity of having to test the light every time just before exposure does not dismay you; it only occupies a few seconds in time. You carry the little meter in your waistcoat pocket, and, arrived at your field of action, make the test. This test will probably serve for the next several exposures, and if by then you have moved from open country to woodland, it will be well to make a fresh test; or

after an hour or so the light will have grown feebler, and so require measuring afresh. Compared with the annoyance, disappointment, and waste of material commonly experienced, this simple preparation is surely worth making.

Of course, there may be those who will say that this plan of mine is too rough and ready. It may be said that consideration must be given to whether the subject is by the sea-coast or on a mountain, where the light is so much more intense, or close to foliage and houses, where the light is not as powerful. Again, it may be alleged that allowance must be made for the prevailing colour of the scene. Of course, this is so, but for the present we can waive these considerations. Remember, I have said that the sensitive paper or meter must be held so as to, as nearly as possible, receive the light in the same way as the subject; and, as a matter of fact, if the subject has a nearly equal amount of light and shade, then hold the meter so that the light falls upon it *as it falls upon the shadows*. If your subject consists of trees or buildings on which the sun does not shine, the side presented to you being in shadow, then hold the meter so that your own body intercepts the sunlight—that is, the meter will be in shadow, just as the principal part of your subject is.

And so for the present this simple course of testing the light, and then

exposing your plate or film for the same fraction of the time the paper takes to tint that on a previous occasion you have found to be approximately correct, will furnish a definite starting-point—a guide without which you are more than likely to flounder about for a long time.

Now, reader, let me take you yourself as an instance. Can you expose a plate or film in your camera and be quite sure that you give it the proper exposure? Of course, there are occasions when one cannot stay to think, or count, or test for exposure; but in such emergencies, whenever they occur, the novice will be much more likely to hit on the right exposure if once he has undergone the simple test recommended in the foregoing.

Forgive me if I seem to assume that you personally possess less knowledge of practical photography than you actually have, for there are some to whom the most elementary lessons are not too simple—of that my weekly correspondence arising out of my weekly chapters for beginners in *The Amateur Photographer* gives me ample proof. And so, to make quite sure that the plan laid down in the foregoing may be perfectly clear, I will just run over it again. What I propose is just this, that if you will devote half an hour or an hour any fairly fine day to establishing a standard, then subsequent exposures cannot present the very least difficulty.

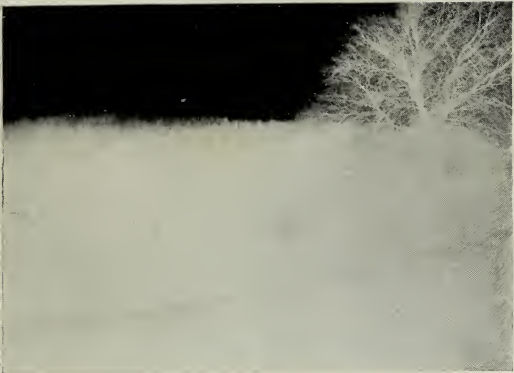


Fig. 1 —An example, after development, of the under-timed or under-exposed plate.



Fig. 2.—An example of the developed plate which has been correctly exposed.



Fig. 3.—An example of a plate which has been over-exposed.



Fig. 1A.—A print from the negative represented by Fig. 1.



Fig. 2A.—A print from the negative represented by Fig. 2.

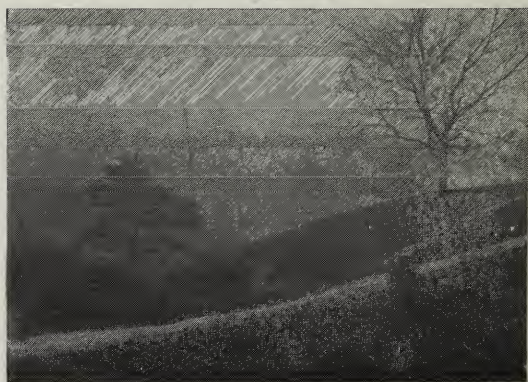


Fig. 3A.—A print from the over-exposed negative represented by Fig. 3;



Fig. 4.—Received an exposure of $\frac{1}{20}$ th of the paper tinting time (under-exposed)

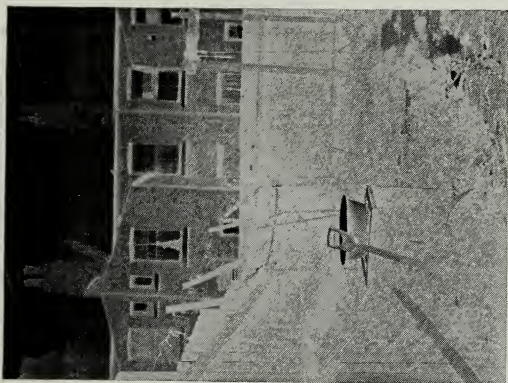


Fig. 5.—Received an exposure of $\frac{2}{20}$ ths (or $\frac{1}{10}$ th) of the paper tinting time (slightly under-exposed).

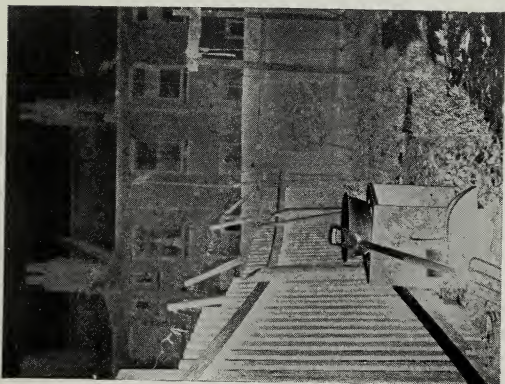


Fig. 6.—Received an exposure of $\frac{3}{20}$ ths of the paper tinting time (correctly exposed).



Fig. 7.—Result of under-exposure.



Fig. 8.—Correct exposure.



Fig. 9.—Result of over-exposure.

If you hold a piece of sensitive paper which discolours in the light, you know that some days it will darken more quickly than on others. This means that the *active power* of the light varies. If, then, we have any depth of tint decided on, some days it may take only six seconds to darken to the degree of that particular tint; another day it may take twelve seconds, or even twenty.

Now is that clear? Light-sensitive paper may take anything between, say, two seconds and sixty seconds to darken to a given degree, thereby plainly indicating how much the power of the daylight may vary. So, also, the sensitive plate or film receiving the light through the lens will also take a short or a long time to receive the impression of light; and because the sensitive paper takes longer and is visible, whereas the plate is quick and the effect is invisible, if we can once ascertain what proportion of the paper-discolouration-time suffices to secure correct plate impression, then on all future occasions we have a ready and conclusive answer to the question, "What exposure shall I give?"

I have no doubt my readers have heard of that very efficient method of finding the exposure by using an exposure meter, which, by a little simple arithmetic and sliding scales of figures, gives the correct exposure for any subject with any plate and any stop, and before completing this Little Book

I will touch upon that method ; but I know that many a novice will fight shy of calculations and figures, and will have a shorter cut, even though it be a less perfect one, or else he will continue in his old extravagant guessing.

That, so it seems to me, is where nearly all the handbooks fail ; they do not provide for the tyro, to whom it is useless to say that certain numbers are to be selected, and multiplied according to circumstances, in order to find the correct exposure—and hence this Little Book and the rest of the series. So I say, first ascertain by exposing sensitive paper in the prevailing light whether we have a two or six, ten, fifteen, or twenty seconds light, and it will be best to use an exposure meter, because it has a standard tint all ready and an easy means of changing the sensitive paper ; and having ascertained the light's power in seconds, you expose several plates in the same light, taking note of the exposures of each in seconds, and then, developing them, decide which of them is correct.

Because I have suggested twelve seconds as the time for the paper tinting, and one-fourth of that time as correct for the exposure of the plate, I do not want it to be supposed that these figures are founded on fact. Do not run away with the idea that, if tomorrow the paper in the meter does happen to tint in twelve seconds or twenty-four seconds, therefore the

plate exposure is to be three or six seconds—that is, one-fourth. No, you must find that out for yourself, because I do not know the speed of the plate you are using, the nature of your developer, and the other circumstances which determine the result. So we will suppose that on a given day the sensitive paper takes fifteen seconds to reach a standard tint, and on the same occasion the plate which appears most satisfactorily exposed was the one to which you gave five seconds' exposure; then we have fifteen and five, which means that *with the same brand of plates* and the *same stop* in the lens, on all future occasions the plate will require an exposure just *one-third* of the time (that is, as 5 is to 15) it takes P.O.P. to darken to the standard tint. But you *must* keep to the same plate and the same stop. These are the only factors which will alter the relationship of plate exposure to paper darkening, and I strongly recommend the beginner to keep to a medium brand of plates and F/16 until he has become somewhat accustomed to his work.

Set up the camera, and, with F/16 stop in the lens, focus the street or the garden or whatever else offers,—hand camera or stand camera, it comes to the same thing; there is only a slight difference in the way of doing it.

Get film or dark slide ready, and then take the exposure meter, set the fresh paper in position, and expose it

in the light as it falls on the subject, and simultaneously start counting seconds. The paper gradually grows dark—10, 11, 12, 13, 14, the paper is as dark as the standard tint alongside it.

Now, then, expose the film or plate, whichever it is, in the camera. Expose one for, say, three seconds, another for seven seconds, and a third for ten seconds—that is, you expose for roughly a quarter, a half, and three-quarters of the time it took the paper to darken. Then these exposures must be developed. Another of these Little Books is especially devoted to development, in which I try to make that sometimes puzzling business perfectly simple ; but if you have not been able to master the business of development, you must do as best you can, and it might be worth while asking a friend or instructing a professional man to develop for you, explaining that all are to be treated in precisely the same way, as you want them as a test.

When you get your three developed negatives home, compare them with the illustrations, figs. 1, 2 and 3, and see which one comes nearest in appearance to fig. 2.

Suppose it is the seven-seconds plate, then you have ascertained that with the plates or films you are using, and with F/16, it takes to get correct exposure just half the time (seven seconds) that it takes to discolour the

sensitive paper to the depth of the standard tint—half the time, mark you ; then, if you are out next week on some open hillside, and you show your meter-paper to daylight, and it almost instantly darkens to the standard tint, taking perhaps only two seconds to do it, then you know that correct exposure will be only one second, or one-half of two seconds. Or perhaps later in the day, when the light is growing feeble, and you are amongst the trees or close to tall buildings, the P.O.P. takes a full minute to darken—sixty seconds ; then you know that your film must have half a minute—one-half of sixty seconds—although the light does not seem so very dull. That's where the utility of the P.O.P. light-testing comes in, because although the light may *seem* good, the paper is able to tell us if its chemical qualities are of the kind which will affect the plate—it is a better judge of the *quality* of the light from the sensitive plate's point of view than ever we can be.

In setting forth this method of ascertaining the approximately correct exposure, I have taken longer than may have seemed necessary, for there is really nothing elaborate in it. There are but five points to remember, which I give here as a summary.

Whether landscape or portraiture or architecture be your quest, you must be able to rely, to some extent at least, on being able to expose correctly, and

hence my desire to make this matter perfectly clear.

1. Test the light, counting the seconds.

2. Make several exposures for various periods less than the time the paper has taken to darken, noting the time given to each.

3. Develop the exposures, or have them developed, and decide which is the most correct; or you can send them carefully packed, and with stamps for return postage, to the offices of *The Amateur Photographer*, 52, Long Acre, London, and you will receive the information you require free by post.

4. Then, whatever fraction of the paper-darkening time the correctly exposed plate was exposed for is to be remembered, and used henceforth.

5. It is essential that you always use the same brand of plates and do not alter your lens stop.

It may give the reader confidence if I tell him the experience of one who, having for some time practised photography with indifferent success, read one of the elementary lessons in *The Amateur Photographer*, from which this series of Little Books has evolved. This reader writes as follows:

“Up to the date of the issue of the *A.P.* containing the chapter on exposure, etc., my few exposures had been far from satisfactory, and development worse. They were, as described in that article, very much ‘hit or miss.’

“After careful perusal of that article

and the succeeding ones, I am pleased to say matters are entirely changed for the better.

“ A packet of actinometer refills, with the standard tints, was obtained, price 6*d.*, and a simple and efficient instrument quickly constructed. During the next few days tests were made in timing the matching of the tints, so as to gain experience.

“ Three exposures were now made on Ilford Empress plates, as per the negatives herewith enclosed, for one second, two seconds, and three seconds respectively, and one extra plate at one second as a test plate for the developer.

“ The paper in the actinometer matched the tint in twenty seconds, the weather somewhat dull, with slight rain falling.

“ Developer used was metol quinol ; and it was found by using the test plate above mentioned that the image appeared in $1\frac{1}{4}$ minutes, and all was obtained in another $11\frac{1}{4}$ minutes, making $12\frac{1}{2}$ minutes in all from the instant of pouring on the developer. The three plates herewith were developed with other portions of the same developer. Nos. 1 and 2 appeared in $1\frac{1}{4}$ minutes each, and no. 3 in 1 minute 10 seconds, and *total* development was in each case ten times this amount.

“ A subject at hand was used for the easy comparison of results ; and white and black objects were introduced to

obtain the full range of tones (I know something of painting in water colour).

“ My exposures are 1-20th, 1-10th, and 3-20th of the actual time taken for the paper to match the standard tint (Wynne’s), and I consider no. 3 about correct, detail just being discerned in the shadows under the dark object in the foreground, and the houses in the distance not lost in over-exposure.

“ My three negatives show the differences distinctly of the various exposures, and the working particulars are correctly stated. Nine other exposures have been made on more difficult subjects, working as above, and every one has been a success.”

The negatives here referred to are reproduced as figs. 4, 5, and 6.

A competition for beginners was then arranged, the conditions in which were that three plates or films should be exposed in the manner I have set forth, and these, when developed, should be sent in, together with an opinion as to which the producer considered the best.

There was a very hearty response, and a great number of negatives and prints were sent in ; and one thing impressed itself on me, and that was that the mere fact of having imposed something like a definite method had been the means of preventing any very erratic mistakes—that is, there were no *extreme* over-exposures, and none very much under-exposed.

You, see, supposing the light to take

six or eight or ten seconds to tint the test-paper, it anyhow secured a limit of from one second to ten seconds exposure, so that if one second had been the right exposure for the negative, probably the longest that one would be likely to overexpose would not exceed seven or eight seconds; because it only took ten seconds to fully colour the paper, and seven or eight times correct exposure would probably not prove a very bad case of over-exposure. Such gross over-exposure as is shown in fig. 2 occurs when the novice takes off the lens cap and then wonders when to put it on again, and whilst wondering probably gives twenty times or thirty times too much. So that, you see, even before completing the test this method of reckoning from the basis of a light-tinted test-paper is something for the tyro to go on.

One of the competitors in the competition referred to sent the following as the description of his three negatives. None of them are very bad, but that which received two seconds, or one-fourth of the paper test, was about the best. I give the description because it may, by telling precisely what one inquirer and student did, encourage and help others.

“The plates are ‘Barnet medium,’ and I followed your instructions as carefully as I could, but I am afraid not sufficiently well to gain a prize. I have received great help from your practical lessons for beginners. I

tested the light with a Wynne's meter ; it took eight seconds, and I exposed the plates severally for $\frac{1}{8} = 1$ second, $\frac{1}{4} = 2$ seconds, and $\frac{3}{4} = 6$ seconds. I developed them all for five minutes with pyro-soda, two grains of pyro to the ounce."

In another set of negatives, which are here reproduced as figs. 7, 8, and 9, it will be noticed from the description that smaller fractions of the paper-test time were adopted ; and whilst none of the negatives are very far wrong, fig. 8 would probably yield the best print.

The description is :

"These were exposed at 9 a.m. ; the stop used was F/16, the paper test (for which I bought a 2s. 6d. Bee meter) took six seconds. No. 1 was exposed for quarter-second, no. 2 for three-quarter, and no. 3 for $1\frac{1}{2}$ seconds. I take it that no. 2 [Fig. 8] is correct."

Once again, before leaving this part of my subject, let me reiterate that this testing method is incomplete and unscientific ; there are cases in which you cannot thus test the light, or it would be a very wearisome task, occupying much too long. Still, as one of the letters reprinted, and many others I have by me, clearly show, it has been the salvation of some ; it gives the beginner a starting-point, and as soon as he has worked by this system a few times he will probably have advanced in his work so much that he will want to have liberty to use other stops than F/16, which thus far,

in order to avoid complications, I have suggested should be always used. But the exposure for a given plate with F/16 being ascertained, the introduction of a stop with smaller aperture merely necessitates the simple multiplication of the ascertained exposure.

If one-fourth the paper test has been ascertained to be correct under the fixed conditions laid down, and on some occasion the paper darkens to the standard tint in eight seconds, then we get two seconds as the exposure; but should it be thought that the movement in the trees or water or anything else demands a shorter exposure, then, if F/11 be used in place of F/16 the exposure becomes just half or one second, or with F/8 half again or half a second.

And now I must for a while break off from the natural sequence of things, and, as it were, take my reader aside to tell him something quite privately, lest others, overhearing, may become confused. When in the pages of *The Amateur Photographer* I suggested the method of ascertaining correct exposure by testing the light and ascertaining the relationship between its power to darken sensitive paper and its power to fully affect the plate through the lens, I thought it best to leave the reader who should apply the method to find out for himself its shortcomings, confident that by the time he had done so he would have so far mastered the

initial difficulties that my purpose would have been attained, and he could afford to dispense with such elementary methods altogether. Assuming that you put my simple method into practice, and, like the correspondents whose letters have been quoted, found a great help therefrom, and have for a time been able to obtain good negatives with greater uniformity than ever you did before, I foresee the possibility of your suddenly finding yourself all at sea again. It may be that you set out for a day's excursion with the camera, and at perhaps ten o'clock in the morning you test the light as prescribed, in order to be furnished at the outset with the required information. The subjects that will engage your attention between your start and your return home will vary very considerably in character. Perhaps in the early part of your ramble you are in the meadows, hedged by spreading trees, with here and there the gable of cottage or farmhouse peeping through the foliage; you are under the open sky, and far and wide the landscape stretches with no dark, heavy object in the field of view. You test the light and find it tints the paper in six seconds, and assuming that you have ascertained that with the stop and the plate you are using one-sixth of the paper-tinting time will be correct, you give one-second exposure and pass on your way.

Presently, beyond the meadows, you come upon broken common land. Here are big dark rocks and dense gorse bushes of deepest green. Down a miniature ravine, like a cleft in the earth, runs a brook of sparkling water, the steep sides being in deepest shadow. Perhaps a bridge spans the brook, under the dark arch of which it seems almost black. Here, you decide, is fine foreground material, and you set about selecting a point of view which shall include all this as well as a pleasing distance. Again you give an exposure of one-sixth the time the paper takes to tint; and as probably only a very little time has passed since the first exposure, and the light has not changed, so you may assume that this will still be one-sixth of six seconds—namely, one second.

A little further on our ramble we reach the top of the hill, and then away before us rolls into the distance and beyond it the sea. With just one big leap you feel you would land right down there in the fields which skirt the shore; there is nothing between you and that distance which unfolds so pleasingly. If this prospect induces the exposure of a plate you will doubtless, for want of warning or experience, give the same exposure of one second, and so on with infinitely varied subjects in the course of a two or three hours' excursion, during which time the light has probably remained unchanged. Now note carefully what

will happen when you subsequently develop those three exposures.

The first will probably come quite satisfactorily, and prove an excellent negative; but when you develop the second, though all goes well at first, you presently find that the dark rocks, the dark bushes, the deep shadow of the bank of the stream and under the bridge, will not budge, and will remain practically unchanged. You continue developing, in the hope that these obstinate objects will eventually respond to the developer; but meanwhile, the sky, the distance, and the lighter parts are getting too dense, and will soon be overdone.

Wondering why the exposure which has proved right for the first subject is evidently not right for the second, you take out the plate in despair, and transferring it to the fixing bath, proceed with the third—that view of distance and sea.

Almost the moment the developer is poured on, you are still more perplexed to find the image flashes up, and all contrast is almost immediately submerged in darkness. Evidently a case of considerable over-exposure; yet you are confident that you gave the same exposure—one second—as the previous test had shown to be correct, and that the outcome of exposure no. 1 confirmed. What, then, is wrong? You had adopted the method of calculating exposure as laid down by me, and when trying subjects

in the garden or near your house it had proved a sure means to success, and had increased your self-confidence. Now your confidence is shaken, and you feel you have been misled or have been the victim of some unaccountable circumstances. But it's all right. Do not judge hastily, but listen to a little explanation I want to give you.

The method I have been giving you is for just common everyday subjects, and I did not want to make any exceptions or give additional rules—anyhow, not at first; and as you know, with ordinary outdoor subjects it worked well enough. But this is the first time you have attempted to apply it to a very varied set of subjects, for there are landscapes and landscapes. There was that first scene in the meadows, of which I said it stretched far and wide without any “dark, heavy object in the field of view.” With that the one-second exposure proved sufficient. But our next subject had dark objects and deep shadows close at hand, and with one second these dark parts proved under-exposed. Again, the wide distant scene with the sea sparkling beyond was of almost dazzling brightness, and with the one-second exposure it proved a good deal overdone. So from this we have a little additional information to be applied to the testing method prescribed, and it is that *allowance must be made for the character of the subject*, and this will vary from a

quarter or even less of the test time in one direction to perhaps six to ten times in the other direction.

That open distance and sea was so very much lighter than the landscape subject of trees and rustic roofs, with a foreground of meadow land, that an exposure of one-fourth or one-sixth of a second would have been ample ; whilst with the second subject, in order to get the darks and shadows sufficiently registered, an exposure of three or four seconds would not have been too much.

Note that in the first subject and in the third there was practically nothing in the foreground. No part of the subject came very near to the camera, and remember that *the nearer an object is the darker it is*, and consequently the more allowance must be made in exposing, as for dark objects.

Also remember that not only near objects count as dark, but also objects of certain colours ; warm colours such as red and brown, also green, count as dark. I will not enlarge on the reason for this now, but merely state that they are what are called *Un-actinic* colours, which affect the sensitive plate less and hence require longer exposure. A landscape or any other view, then, containing dark objects, very near objects (unless such near objects are very brilliant and light), and things which are deep green, red, or brown, must be given a longer exposure than that which you have

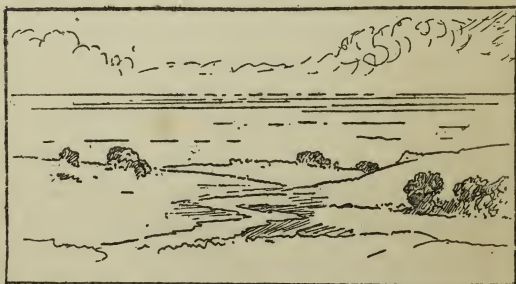
arrived at from making your tests on a scene which does not contain such matters.

I would very much rather not have to make these exceptions to the system I have been explaining, and suggest that allowances must be made according to the subject; but if you desire to include in your collection of photographs widely varying subjects, then I am afraid there is no help for it; and, after all, the allowances to be made do not really complicate the matter very seriously if you just consider the character of the scene before you. Roughly speaking, you may classify landscapes into three or four groups. Suppose we take first open landscape—some such view as that which I supposed was the first of the three described—and with this we will continue to assume the correct exposure to be one second; then with seascapes and extreme distances from a half to a quarter of a second will suffice, whilst with landscapes with dark objects in foreground two, or three, or even four seconds may be necessary. Darker, because nearer, will be figures, groups, and buildings, and these may need still longer exposures—from three or four up to even six or more.

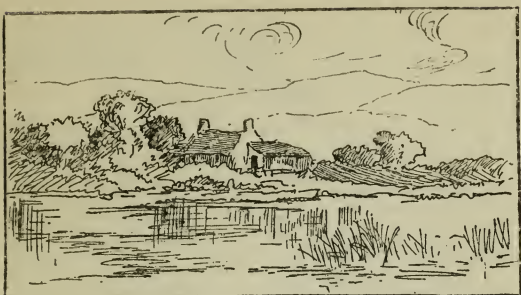
Still, your test giving one second for standard normal subjects will have given you the necessary starting point, without which you might very well be floundering about anywhere between a snapshot and ten seconds, guessing all the while without any guide.

It is quite possible that my description of the three subjects I have imagined you doing during a morning's excursion may not have been sufficiently graphic to have made the classification of out-door subjects clear to some of my readers. Moreover, the space at my disposal on the illustration pages does not admit of my reproducing three typical examples of the various kinds, beyond pointing out that the subject of figs. 1, 2, and 3 may be taken as a fair example of general open landscape without dark objects in the foreground. The subject of figs. 4, 5, and 6 would certainly exemplify the class under which would come "Figures, groups, *buildings*, and very near (dark) objects"; whilst figs. 7, 8, and 9 is an outdoor subject which might be classified under "landscape with dark objects in foreground."

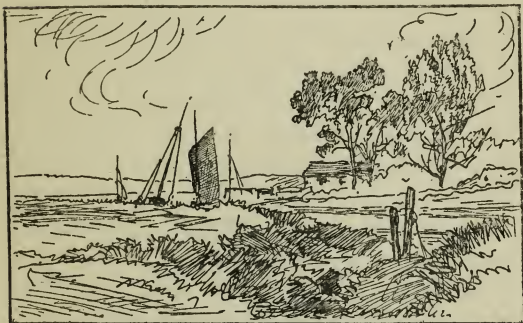
As a further guide here are a few little diagrams or sketches with *approximately* the *comparative* exposures in seconds or fractions of a second.



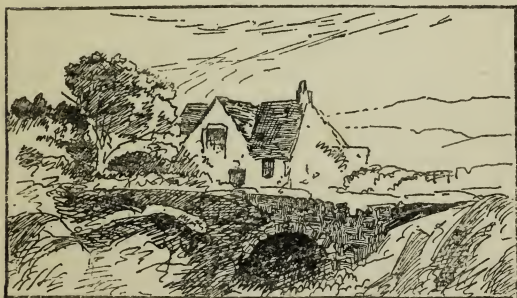
No. 1. Seascape and extreme distance,
 $\frac{1}{8}$ to $\frac{1}{10}$ second.



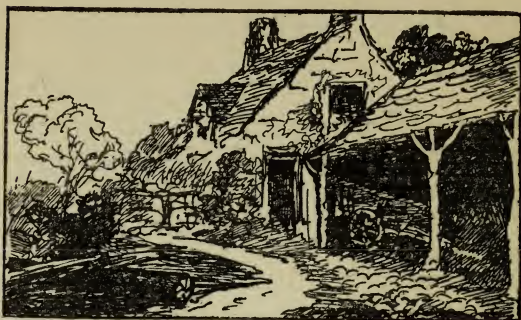
No. 2. Light and open landscape, with water and no dark objects in foreground, $\frac{1}{2}$ to $\frac{1}{4}$ second.



No. 3. General landscape with medium foreground, 1 second.



No. 4. Landscape with dark objects in foreground, 2 to 3 seconds.



No. 5. Buildings, etc., the greater part of the subject near to, and of non-actinic colour,
4 to 6 seconds.

One does not, of course, like to restrict even the beginner to any particular class of subject, but those with a great deal of heavy shadow are generally more difficult because, though the general character demands a long exposure, there are sure to be some light regions, which, of course, will be over-exposed if the dark parts are to be exposed enough, and these may give a little trouble in development. Still, the rule holds good. Expose sufficiently for the dark parts, whatever happens to the lighter. Moreover, a considerably over-exposed plate or film may still produce a good negative, but an under-exposed one is hopeless. Probably no book or series of lessons can at once make any one perfect in the matter of estimating exposures, but I feel that, if the foregoing pages are read and understood, the novice will soon be on the right road.

Now I hinted that once the right exposure is known with any one stop, that required for any other stop may be at once ascertained by doubling or halving the exposure, according to whether the aperture or stop be the one smaller in diameter or larger, and you may have thought the series of figures which mark the stops rather unaccountable—F/8, F/11, F/16, F/22, F/32, and so on. Why should they not be marked 1, 2, 3, 4, etc. Well, in some lenses this is so, but in either case the stop next in numerical succession—that is, the next highest figure—requires double the exposure, because the area of the circular opening is one-half, and therefore admits only half the volume of light, and so requires twice the time. F/8 merely means that the diameter of the opening is one-eighth the distance from the lens to the plate, which is called the “focus,” or focal length of the lens.

You don't want to know all this, I daresay; still, there is no harm in my telling it you. Anyhow, it is as well you should know that each stop requires either half or double the exposure required by its next neighbour. So, still supposing two seconds to be correct with F/16, the time for other stops would be as under :

Stop	F/8	F/11	F/16	F/22	F/32	F/45	F/64
Seconds	$\frac{1}{2}$	1	2	4	8	16	32

Similarly, you can multiply the

estimated exposure or reduce it, accordingly as you know how much more rapid or how much slower some plate is which you for some particular reason wish to substitute for the variety you set out to use.

Here I want to anticipate a possible perplexity which might arise. You may already have found out how widely different are the exposures required for an ordinary landscape, and for an open view of sea and sky; if not, you will not be greatly surprised to learn that between a landscape with its browns and greens and other colours, and a view of only sea and sky, all delicate colours and full of light, the difference in exposure is very great. So bear in mind that in extreme cases you may have to say to yourself at the time of exposure that, although one-fourth or one-sixth or whatever it is gives you two seconds as the exposure, yet, in view of the unusually dark colouring of the scene, and the presence of a number of exceedingly black objects, you will give three seconds. On the other hand, you may have to say, "This scene is so very light and airy that it can hardly be calculated on normal lines—blue sea and blue sky with white clouds, I can give a good deal less than the correct normal exposure." But now we are getting on in the direction of figures and calculations, which it is my desire you should avoid at the outset. But presently I will refer briefly to the full use of the

exposure meter, which at present we have only been employing to test the light.

Before doing so, however, I should like to point out that thus far we have had chiefly in our minds outdoor subjects ; but what about portraits indoors, and interiors such as the inside of a cathedral or church ? Of course, the same principle obtains, but in some interiors you would find the actinometer paper take an inconveniently long time to tint, because the light is so much more feeble indoors than it is outdoors. Perhaps it has never occurred to you how comparatively dark the lightest houses or rooms really are. Remember how, on passing out through an open door, instantly you are conscious of the out-of-doors light. Even when leaving a brilliantly lighted building after a *matinée* performance, how much lighter it seems outside when you regain the street ! Think if a hole like a window were made in the wall of your room, how at once you would become aware of the light outside. How much lighter is the window than even the lightest and daintiest picture hanging on your walls.

And so we may come to realise how great a difference there is between the light which illuminates our landscape subjects, and that with which indoor scenes and portraits are lighted, and, of course, our exposures will be influenced in proportion to this difference.

In a dimly lighted church interior half an hour or even an hour's exposure may be necessary ; and suppose, having ascertained that three times the paper-tinting time is correct and proceeded to test the light, why, then, in such a dark interior as that which has been suggested, the paper would take twenty minutes to reach the standard tint, so that testing and then exposing would occupy one hour and twenty minutes.

Perhaps, however, it will occur to you that, whilst if an exposure of one hour is necessary, then there is no help for it and one hour's exposure will have to be given, yet the twenty minutes can be saved by uncapping the lens and starting the test simultaneously.

Thus you have determined that the right exposure is three times the paper tint ; then commence the exposure at once, and simultaneously set the actinometer. Suppose the paper in the actinometer tints to the standard colour in a quarter of an hour, then you continue the lens exposure for another half-hour, making in all three times the quarter-hour test.

Mr. J. H. Avery, who has had much experience in photographing architectural interiors, has given a ready method of judging the exposure without testing the light. It is as follows. Arrange the focussing cloth well over the head, and use the lens with open aperture—that is, without any stop

in, or with the largest opening the diaphragm will admit of—and keep the head under the focussing cloth until you can just see the image all over the plate. Then, without uncovering the head, proceed to slowly stop down until, your eyes having in the meantime grown somewhat accustomed to the darkness, you can only just see the image all over the plate; then, using an “Extra Rapid” plate, an exposure of ten minutes will yield a satisfactory negative.

Suppose you find that, having stopped down to F/32, the image is just visible, but with a smaller stop is not, then you say the exposure will be ten minutes with F/32, and if you wish to use F/64 you will at once calculate: $F/32 = 10$ minutes; $F/45 = 20$, or twice 10; $F/64 = 40$, or twice 20. Similarly, you would increase or decrease the exposure according as you choose to use a slower or more rapid plate.

This method seems to imply a not very dark interior, but will doubtless be found useful when photographing most public buildings. Now, when you come to take portraits indoors you will use a very large stop, and this will facilitate matters by rendering a shorter exposure possible, else one could not get one's sitter to remain perfectly motionless for anything like the period which it has been suggested may be required for interiors of buildings.

In the case of portraits it is all but

necessary to ascertain as nearly as possible what the exposure is to be beforehand, thus avoiding putting your model to inconvenience and strain. The light might, in many cases, be approximately gauged on a previous day, or at least a few minutes before the portrait is to be taken ; but except for the expediency of deciding the exposure in advance, there is nothing essentially different in taking a portrait or an architectural interior. It now remains to, as briefly as possible, describe what must be regarded as the most scientific and reliable method of ascertaining right exposure, and that is by using an exposure meter not only to ascertain how long the light takes to reduce the sensitive paper to a standard tint, as it has already been suggested should be done, but also to tell exactly what length of exposure should be given with a plate of any particular speed, and with any particular stop in the lens.

First of all, there are certain exposure tables which may be found exceedingly useful, though they cannot be regarded as anything more than a makeshift, or at most as only approximately correct exposure time. I give one such exposure table, which is an abridgment of that given in the *Barnet Book*, and it will be seen that in the first place three different stops are arranged for, and three different speeds of plates are calculated for, and then the exposure in seconds or

fractions of seconds are given for six different kinds of subjects, the exposures being calculated for sunshine at noon at midsummer—that is to say, when in the northern hemisphere the daylight is at its maximum; and hence, if an exposure is to be made, say, in April or September, and the weather is cloudy, allowance has first to be made for the light, less on account of the clouds, than on account of the light

		Bright Clouds and Sky	Sea- scapes and Extreme Distance	Open Land- scapes	General Land- scapes with Dark Objects in Fore- ground	Figures, Groups, and Build- ings near to	Portrait in well- lighted Rooms and light interiors
F	Ordinary .	$\frac{1}{125}$	$\frac{1}{30}$	$\frac{1}{15}$	$\frac{1}{4}$	$\frac{1}{3}$	15
11	Medium .	$\frac{1}{250}$	$\frac{1}{60}$	$\frac{1}{30}$	$\frac{1}{8}$	$\frac{1}{6}$	8
	Ex. Rapid .	$\frac{1}{500}$	$\frac{1}{120}$	$\frac{1}{60}$	$\frac{1}{16}$	$\frac{1}{12}$	4
F	Ordinary .	$\frac{1}{60}$	$\frac{1}{15}$	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	30
16	Medium .	$\frac{1}{125}$	$\frac{1}{30}$	$\frac{1}{15}$	$\frac{1}{4}$	$\frac{1}{3}$	15
	Ex. Rapid .	$\frac{1}{250}$	$\frac{1}{60}$	$\frac{1}{30}$	$\frac{1}{8}$	$\frac{1}{6}$	8
F	Ordinary .	$\frac{1}{30}$	$\frac{1}{8}$	$\frac{1}{4}$	1	$1\frac{1}{2}$	60
22	Medium .	$\frac{1}{60}$	$\frac{1}{15}$	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	30
	Ex. Rapid .	$\frac{1}{125}$	$\frac{1}{30}$	$\frac{1}{15}$	$\frac{1}{4}$	$\frac{1}{3}$	15

being less powerful in spring and autumn than it is at midsummer. Doubtless, to the wholly uninitiated, such a table will prove very useful as a guide. And now as to the use of the meter.

Taking the Watkins meter as a type, it has a detachable end held by a chain, and the pendulum when swung can be relied on to swing once to the second; so, placing the meter in such a position that it receives the same

amount of light as the shadow portions of the subject, the chain or pendulum is set swinging, and the seconds counted whilst the test paper darkens to the standard tint. This is what we did before when testing the light. Now, a card is published giving a speed number for every known brand of plate ; these speed numbers have been ascertained by actual experiment, and may be called the P or plate numbers ; also certain numbers are assigned to the various stops, which we will call D numbers (D for diaphragm). Now a meter has four sets of figures on sliding scales, so we refer to the card and find the P number, and set that opposite the D number, according to the stop we decide to use ; and then, ascertaining by test the light or actinometer number (A number), we slide A opposite the P and D, and on the fourth we find immediately recorded the E or exposure number. Thus, the exposure required is told, and this may have to be multiplied or divided, according to figures given on a special table for exceptional subjects.

Whilst on this subject of testing the light with an actinometer and then setting the scales of figures so as to show the exposure required, it will be appropriate to say a word or two as to the manner in which this testing of the light should be carried out.

In practically every subject there are dark portions and light portions, and, theoretically at least, the dark portions

should receive longer exposure than the light. But of course this is impracticable; the same exposure must suffice for both, and you might perhaps conclude that an exposure midway between that demanded by the darks and that required by the lights would be a happy medium which would meet the case. This is not so, however.

If you have read the Little Book devoted to the subject of Development, or if you have had a little experience in developing, you will have learnt that, whilst a considerable amount of over-exposure is not fatal to satisfactory results, a very moderate amount of under-exposure is a matter which cannot be remedied. It follows, therefore, that sufficient exposure must be given for the darks or shadows, even though such a course involves over-exposure of the lights. It is necessary, therefore, when testing the light, to test it as it is in the shadow portions of your subject; as Mr. Watkins has it in his *Manual*, "Test the light which falls upon the shadiest part of the subject on which full detail is required." This may not seem easy, because the subject may be at some distance, and you cannot very well have the camera and walk a quarter of a mile in order to attain to the shady portion, in which case the shadow of the body may be substituted. If it is a street scene, hold the actinometer close to the wall or house in the shade.

If the subject is evenly lighted, and

the shadows so unimportant that they can be ignored, hold the actinometer so as to face the full amount of sky or sunshine, as the case may be ; but take care not to overshadow the instrument with your head while watching the darkening of the paper, and do not pay attention to the colour of the paper as it darkens, but merely to the depth, such observation being much facilitated by holding the meter at arm's-length and watching the darkening tint through half-closed eyes.

Whether the exposures are estimated by the fraction of the paper-darkening time, or by the more precise actinometer scales of figures, it will be hardly necessary to test before every exposure; and provided you are liberal and err on the side of giving a *full* exposure, then probably a couple of tests will suffice for a whole day's work, and when suddenly coming upon a subject you will not have to risk its changing whilst a light test is made. This is particularly the case when photographing figures, animals, etc., in which cases the light should be tested and the exposure calculated before the final posing or selection of point of view.

When photographing interiors, which are usually very much darker than the darkest outdoor scene, the time which the paper would take to darken would be inconveniently long ; hence Mr. Watkins's plan is to expose the actinometer simultaneously with the camera

exposure; and in order to further facilitate matters the actinometer should be furnished with a "quarter time," four times which would give the normal or full time. It is further recommended by some to slope down the lens so that the plate exposure may be greatly prolonged, and occupy the same time the paper takes to darken.

An exception, too, must be made when photographing interiors, the actinometer being placed so as to receive the fair average lighting of the whole subject, and with the face of the instrument towards the window or chief source of light.

I do not think it would be within the scope of this Little Book to detain my reader longer with this ingenious system of ascertaining the right exposure under given or set conditions, by means of sliding or revolving scales of figures. The reader who desires to follow it further cannot do better than procure the little shilling *Manual* issued by Mr. Alfred Watkins, which contains explicit and exhaustive instruction.

Finally, let me impress upon my reader the necessity of doing something to ensure his exposures being approximately right in a certain percentage of cases. Of course, every one makes mistakes sometimes, either through error of judgment or mere oversight; but some sort of certainty must be attained, and then we may pass on to

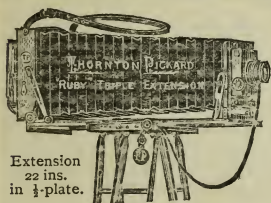
the next Little Book, which has to do with developing.

I am most keenly desirous of helping the beginner in photography, and I can render him no better service than helping him to get right exposures, and next in developing correctly. But even after complete lessons in these important stages in the process, accidents and mistakes will occur ; hence the third of these Little Books, which, by the way, was published first, “ How to Make Bad Negatives into Good,” and with these three and a reasonable amount of common sense I really do not see any reason why the novice who reads should not be successful.

The series of Little Books will not cease with these three, but future issues will deal with specific branches of photography—“ Portraiture,” “ Pictorial Composition,” etc.

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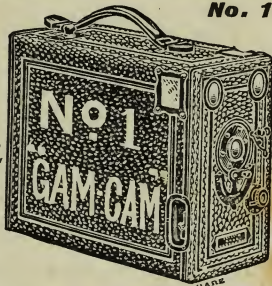
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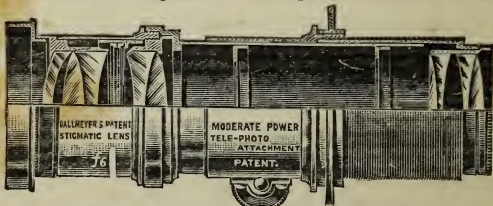
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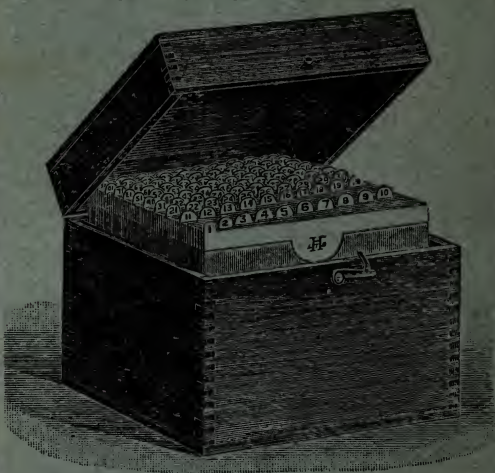
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